CONFIDENTIAL TO COUNSEL

TRANSIT ASSESSMENT DISTRICT COST STUDY

CITY AND COUNTY OF SAN FRANCISCO
OFFICE OF THE CITY ATTORNEY

DETERMINATION OF NET DEFICIT FOR DOWNTOWN TRANSIT SERVICE FOR FISCAL YEAR 1981-82

Touche Ross & Co.

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OCTOBER 1, 1981

TOUCHE ROSS & CO.

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INTRODUCTION

The purpose of this report is to describe, in some detail, the methodology used to determine the net deficit for downtown transit service in San Francisco. Comprehensive documentation of formulas used, data sources and other supporting information will be found in the project workpapers.

The deficit for the San Francisco Municipal Railway (MUNI) is defined as the difference between the cost of providing transit service and the revenues used to defray this cost (other than General Fund receipts). The net deficit is defined as the deficit incurred for that level of service provided to a specified Downtown District in excess of the level of service provided to the rest of San Francisco. The difference in level of service is measured in terms of the relative concentrations of costs and revenues per square mile for the two areas. The major steps in our approach are outlined in Exhibit 1.

Throughout our analysis, we have endeavored to be conservative when estimates have been required. We have utilized conventional cost accounting methods to allocate costs and revenues and considered a range of alternative approaches before selecting each allocation method. We relied upon available operating and financial data and did not conduct an audit of any of the information provided. Accordingly, we cannot and do not express an opinion of the accuracy of the underlying data.

Our study is based on actual revenues, expenditures and operating data for fiscal year 1980-81. We have calculated the net deficit for fiscal year 1981-82 based on these data and recommend that, in future years, the net deficit should be determined from the actual results of the prior year.

For fiscal year 1981-82, we have determined the net deficit for downtown transit service to be $20,780,215. This result reflects our decision to exclude certain revenues and expenditures in order to ensure that the resulting net deficit is conservative. In future years, if MUNI management is able to provide improved financial and operating data, some of the excluded items could reasonably be included in the fee.

Our calculation of the fee is based on the boundaries of the Downtown District as recommended by Gruen Gruen + Associates. Details of the Gruen Gruen + Associates methodology can be found in their report "Special Benefit of MUNI to Downtown San Francisco," dated September 1981. District boundries are outlined in Exhibit 2. Should these be modified prior to enactment of assessment district legislation, the fee could change by a material amount and would have to be recalculated.

EXHIBIT 1

DETERMINATION OF THE FISCAL YEAR
1931-82 NET DEFICIT

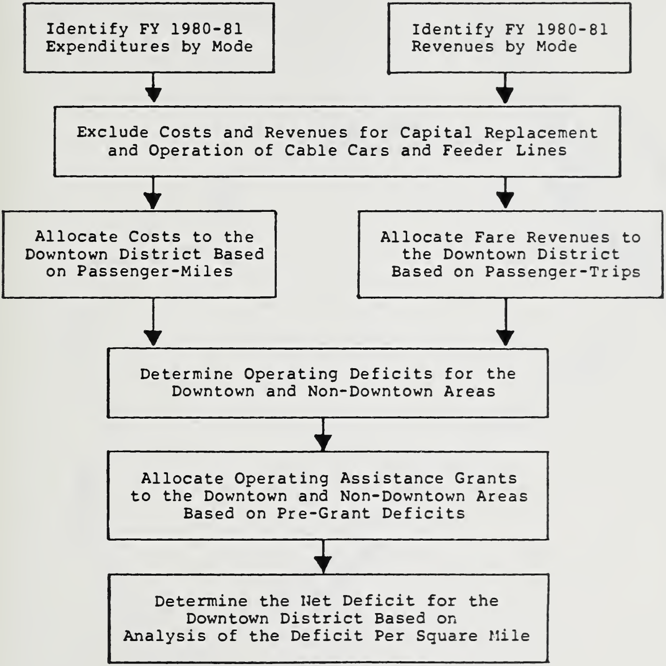
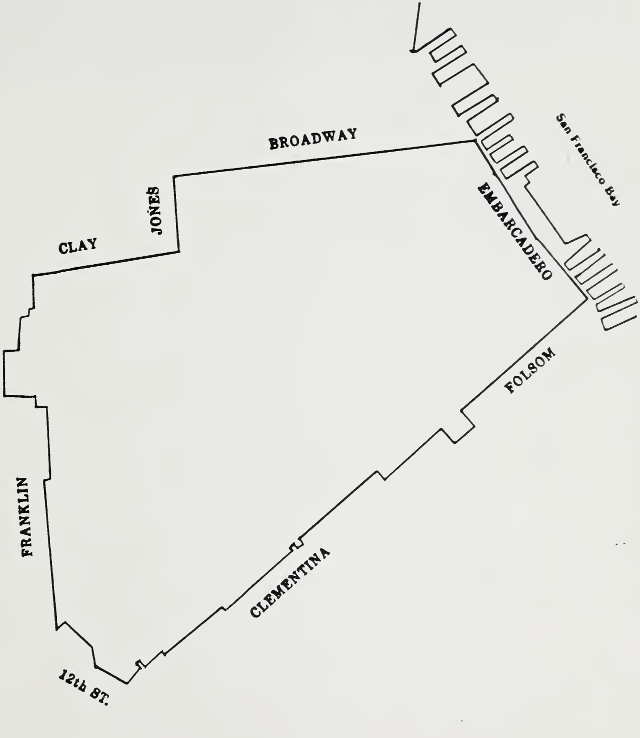


EXHIBIT 2

GEOGRAPHIC BOUNDARIES OF THE
DOWNTOWN DISTRICT



The balance of this report is organized into three sections: "Analysis of Costs and Revenues," "Allocation to the Downtown District," and "Determination of the Net Deficit." In the first section, we present the results of our analysis of operating costs and revenues, the cable car deficit, capital replacement requirements and feeder line costs and revenues. In the second section, we describe the methodology to allocate costs and revenues to the Downtown District, the sample ridership data used for this purpose and the actual allocations to the District. Finally, we present in the third section the rationale and calculation of the net deficit for the Downtown District.

ANALYSIS OF COSTS AND REVENUES

Analysis of Operating Costs

A detailed review of 1980-81 operating costs for the Municipal Railway has been completed including:

- MUNI operations and direct administration;
- A portion of the PUC Bureaus of Administration, Finance, Management Information Systems, Engineering, Energy and the Office of the General Manager;
- A portion of the Hetch Hetchy Project for transit support;
- City legal services supporting the MUNI; and
- Interest payments on capitalized leases for assets held by the San Francisco Municipal Railway Improvement Corporation.

The cost accounting structure and actual year-to-date expenses employed in this analysis are those found in the June 16, 1981, issue of the MTA 785 computer report, "Organizational Management Performance Report as of May 31, 1981," prepared by the PUC Bureau of Finance. Actual costs reported in that document were reviewed for reasonableness by comparison with other available data and were corrected to prevent errors which could materially affect the allocations to be made.

Sources for other available data consist of separate financial and operating reports as well as interviews with key individuals responsible for areas where additional documentation was required. The level of detail pursued was that required to as 're confidence in materially but conservatively approximating and allocating actual annual expenses by mode for fiscal year 1980-81.

Exhibit 3 summarizes the allocation to mode. Exhibit 4 describes the allocation of direct MUNI operating costs to mode, and Exhibit 5 the allocation of other PUC expenditures to MUNI and then to mode. At the conclusion of this report, sources and supporting data for the allocations are presented in Appendices 1 and 2. The annualization procedures used to adjust reported expenditures are outlined in Appendix 3. Appendix 4 describes the organization of the three exhibits in detail and the conventions used in the text of the exhibits.

EXHIBIT 3

Summary of Total Operating Costs by Mode: Fiscal Year 1980-81

Account Number	Account Name	Cost Description	Allocation Method to MUNI	Allocation Method to Mode	Street Car	Cable Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Total
1-33000	MUNI	All	All to MUNI	Sum of 1-33X00 Accounts, Exhibit 4	$4,719,214	$6,810,515	$26,267,547	$55,948,696	$13,326,605	$107,072,577
1-32000	Bureau Summary	All	Sum of 1-32X00 Accounts, Exhibit 5	Sum of 1-32X00 Accounts, Exhibit 5	991,120	1,131,774	2,740,966	5,213,465	528,038	10,605,363
3-90010	Interest, San Francisco Municipal Railway Improvement Corporation	All	Total Scheduled Lease Payments*	Scheduled Lease Payments, Cable Car/Light Rail Vehicle Facilities Lease #1A split per Al Hollett, X3334*		4,040		923,725	653,851	1,581,616
1-35210	Hetch Hetchy Transit Power	All	All to MUNI	1.5 Percent Cable Car, 98.5 Percent by Total Vehicle Hours for Street Car, Trolley Coach, Light Rail Vehicle per Ray Protti, X5985	167,450	28,608	1,376,215		334,898	1,907,171
	City Legal Services	Claims Support	Sum of Actual Expenses	Percentage of Actual Claims Payments through March 31,1981*	171,872	142,728	186,830	457,810	5,790	965,030
	City Legal Services	Non-claims Support	Percentage of PUC Budget vs. Water/Hetch Hetchy*	Scheduled Total Vehicle Hours*	11,342	15,521	90,141	159,090	22,387	298,481
	PUC	All	Sum of Above Accounts	Sum of Above Accounts	$6,060,998	$8,133,186	$30,661,699	$62,702,786	$14,871,569	$122,430,238
				Percent of Total Operating Cost	4.95%	6.64%	25.04%	51.22%	12.15%	100.00%
				Percent of Scheduled Total Vehicle Hours*	3.8%	5.2%	30.2%	53.3%	7.5%	100.0%

* See Appendix 1

EXHIBIT 4

Allocation of MUNI Operating Costs to Mode: Fiscal Year 1980-81

Account Number	Account Name	Cost Description	Allocation Method to Mode	Street Car	Cable Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Total
1-33110 1-33120 1-33150	Operations Administration Field Support Services Field Operations	All less Station Agent and Supervisor Payroll	Scheduled Total Vehicle Hours*	$2,442,079	$3,341,792	$19,408,100	$34,253,369	$ 4,819,892	$ 64,265,232
1-33150	Field Operations	Station Agent and Supervisor Payroll	All to Light Rail Vehicle					853,120	853,120
1-33130	Training and Safety	All	Cumulative Training Schedule Course Units *	7,207	24,025	103,784	207,568	137,898	480,482
1-33140	Schedule and Traffic	All	Scheduled Total Vehicle Hours*	31,038	42,473	246,670	435,349	61,259	816,789
1-33100	Operations Division	All	Sum of 1-331X0 Accounts	2,480,324	3,408,290	19,758,554	34,896,286	5,872,169	66,415,623
1-33210	Equipment Maintenance, Administration	All	Combined Allocation Percentage of 1-33230 and 1-33240	95,233	61,510	357,420	1,563,862	296,861	2,374,886
1-33230	Equipment Maintenance, Automotive	All	All to Motor Coach				18,116,061		18,116,061
1-33240	Electric Vehicle Maintenance	All	Combined Allocation Percentage for MTA 785 Accounts 3-210XY; X = 0 to 8; Y = 1 to 5	1,103,889	713,065	4,139,349		3,437,557	9,393,860
1-33200	Equipment Maintenance,	All	Sum of 1-332X0 Accounts	1,199,122	774,575	4,496,769	19,679,923	3,734,418	29,884,807
1-33310	Facility Maintenance, Administration	See Note 1	Combined Allocation Percentage of 1-33330 and 1-3334Y; Y = 1 to 4 (MTA 785 Accounts 3-3001Y; Y = 1 to 5 and 3-22019 included in 1-33310 from 1-33340)	18,471	47,892	32,287	16,536	67,330	182,516
1-33330	Facility Maintenance, Cable Car	See Note 2	All to Cable Car		2,283,186				2,283,186
1-33341	Ways and Structures, Track Maintenance	See Note 2	To Street Car and Light Rail Vehicle by Scheduled Total Vehicle Hours*	323,300				647,200	970,500
1-33342	Ways and Structures, Signal Maintenance	All	All to Light Rail Vehicle					1,317,609	1,317,609
1-33343	Ways and Structures, Maintenance Schedule	All	Combined Allocation Percentage of 1-3334Y; Y = 1,2,4 less MTA 785 Accounts 3-3001Y; Y = 1 to 5 and 3-22019	26,251	6,593	45,891	23,499	95,722	197,956
1-33344	Ways and Structures, Building Maintenance	Payroll: See Note 3	See Note 3	331,400	104,600	547,600	516,400	670,000	2,170,000
1-33344	Ways and Structures, Building Maintenance	Material and Supply	Allocation Percentage of 1-33344 (Payroll)	63,639	20,088	105,149	99,189	128,654	416,719
1-33344	Ways and Structures, Building Maintenance	Other Contract Services	Allocation Percentage of Floor Space. Street Car and Light Rail Vehicle Split by Scheduled Total Vehicle Hours*	59,282	29,437	164,887	136,675	119,889	510,170
1-33344	Ways and Structures, Building Maintenance	Light, Heat and Power: Propulsion	See Note 4	129,089	63,138	723,772		490,202	1,406,201
1-33344	Ways and Structures, Building Maintenance	Light, Heat and Power: Other Electric	Allocation Percentage of Floor Space. Street Car and Light Rail Vehicle Split by Scheduled Total Vehicle Hours*	13,224	6,567	36,782	30,489	26,745	113,807
1-33344	Ways and Structures, Building Maintenance	Light, Heat and Power: Gas and All Other	Allocation Percentage of Floor Space. Street Car and Light Rail Vehicle Split by Scheduled Total Vehicle Hours*	28,742	14,272	79,944	66,265	58,127	247,350
1-33300	Facility Maintenance	All	Sum of 1-333X0 Accounts	993,398	2,575,773	1,736,312	889,053	3,621,478	9,816,014
1-33410	MUNI General Manager, Administration	All: See Note 5	Scheduled Total Vehicle Hours*	21,582	29,534	171,523	302,721	42,597	567,957
1-33420	MUNI General Manager, System Safety	All: See Note 6	See Note 6	15,103	9,090	27,418	44,867	36,828	133,306
1-33430	MUNI General Manager, Planning	All: See Note 7	Scheduled Total Vehicle Hours*	9,685	13,253	76,971	135,846	19,115	254,870
1-33400	MUNI General Manager	All	Sum of 1-334X0 Accounts	46,370	51,877	275,912	483,434	98,540	956,133
1-33000	MUNI	All	Sum of 1-33X00 Accounts	$4,719,214	$6,810,515	$26,267,547	$55,948,696	$13,326,605	$107,072,577

* See Appendix 1

EXHIBIT 5

Allocation of PUC Operating Costs to MUNI and to Mode: Fiscal Year 1980-81

Account Number	Account Name	Cost Description	Allocation Method to MUNI	Allocation Method to Mode	Street Car	Cable Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Total
1-32110	Bureau of Administration, Administration	All	Percentage of PUC Budget vs. Water/Hetch Hetchy*	Scheduled Total Vehicle Hours*	$ 8,443	$ 11,554	$ 67,101	$ 118,426	$ 16,664	$ 222,188
1-32120	Bureau of Administration, Personnel	Workman's Compensation	Percentage of Actual Payments through March 31, 1981 vs. Water/Hetch Hetchy*	Percentage of Work Days Lost Due to Injury through March 31, 1981*	72,428	281,169	588,940	854,186	145,051	1,941,774
1-32120	Bureau of Administration, Personnel	Non-Workman's Compensation	Percentage of Headcount vs. Water/Hetch Hetchy*	See Note 8	19,284	26,388	153,255	270,481	38,060	507,468
1-32130	Bureau of Administration, Elderly and Handicapped	All	All to MUNI	Scheduled Total Vehicle Hours*	4,851	6,638	38,553	68,042	9,574	127,658
1-32140	Bureau of Administration, Claims	All	See Note 9	Percentage of Actual Payments through March 31, 1981*	739,827	614,377	804,214	1,970,658	24,924	4,154,000
1-32150	Bureau of Administration, Marketing	All	All to MUNI	Scheduled Revenue Vehicle Hours*	27,397	37,515	202,170	366,136	55,137	688,355
1-32160	Bureau of Administration, Industrial Safety	All	None to MUNI							
1-32170	Bureau of Administration, Real Estate	All	None to MUNI							
1-32100	Bureau of Administration	All	Sum of 1-321X0 Accounts	Sum of 1-321X0 Accounts	872,230	977,641	1,854,233	3,647,929	289,410	7,641,443
1-32210	Bureau of Finance, Administration	All	Percentage of PUC Budget vs. Water/Hetch Hetchy*	Not Applicable						54,827
1-32220	Bureau of Finance, Control and Collection	All	Percentage of PUC Budget vs. Water/Hetch Hetchy*	Not Applicable						1,601,829
1-32230	Bureau of Finance, Budget Analysis	All	Percentage of PUC Budget vs. Water/Hetch Hetchy*	Not Applicable						53,615
1-32240	Bureau of Finance, Resource Development	All	See Note 10	Not Applicable						36,920
1-32250	Bureau of Finance, Audit	All	No Expenses	Not Applicable						
1-32200	Bureau of Finance	All	Sum of 1-322X0 Accounts	Scheduled Total Vehicle Hours*	66,393	90,854	527,652	931,253	131,039	1,747,191
1-32310	Bureau of Management Information Systems, Administration	All	Combined Percentage of 1-32320 and 1-32330 vs. Water/ Hetch Hetchy	Not Applicable						114,046
1-32320	Bureau of Management Information Systems, Operations	All	Estimated Percentage of Machine Time vs. Water/Hetch Hetchy*	Not Applicable						559,626
1-32330	Bureau of Management Information Systems, Systems/Programming	All	See Note 11	Not Applicable						274,251
1-32340	Bureau of Management Information Systems, Technical Support	All	Combined Percentage of 1-32320 and 1-32330 vs Water/Hetch Hetchy	Not Applicable						38,492
1-32300	Bureau of Management Information Systems	All	Sum of 1-323X0 Accounts	Scheduled Total Vehicle Hours*	37,484	51,294	297,897	525,759	73,981	986,415
1-32410	Bureau of Engineering, Administration	All	MTA 785 Account 2-41300	Not Applicable						38,079
1-32420	Bureau of Engineering, Contract Administration	All	MTA 785 Account 2-42300	Not Applicable						5,224
1-32430	Bureau of Engineering, Project Administration	All	None to MUNI							
1-32440	Bureau of Engineering, Field Construction	All	None to MUNI							
1-32450	Bureau of Engineering, Chief Engineer	All	None to MUNI							
1-32400	Bureau of Engineering	All	Sum of 1-324X0 Accounts	Percentage of Number of Grants Processed*	7,907	2,260	4,707	8,847	19,582	43,303
1-32500	Bureau of Energy	All	None to MUNI							
1-32600	Bureau of PUC General Manager	All	Percentage of PUC Budget vs. Water/Hetch Hetchy*	Scheduled Total Vehicle Hours*	7,106	9,725	56,477	99,677	14,026	187,011
1-32000	Bureau Summary	All	Sum of 1-32X00 Accounts	Sum of 1-32X00 Accounts	$991,120	$1,131,774	$2,740,966	$5,213,465	$528,038	$10,605,363

* See Appendix 1

Excluding depreciation and capital expenditures, the full operating costs of the MUNI transit system in fiscal year 1980-81 are estimated to equal $122,430,238, allocated to mode as follows:

Mode	Expenditures ($000)	Percent of Total
Street Car	$ 6,061.0	4.95%
Cable Car	8,133.2	6.64
Trolley Coach	30,661.7	25.04
Motor Coach	62,702.7	51.22
Light Rail Vehicle	14,871.6	12.15
TOTAL	$122,430.2	100.00%

Analysis of Operating Revenues

Total operating revenue consists of the sum of passenger fares, other local revenues and grants received for operating assistance. Other local revenues result from advertising, nonoperating rent and miscellaneous sources such as minor equipment sales. For analytical purposes described in a later section of this report, revenue attributable to the cable cars has been estimated and excluded from the total operating revenue to be allocated to the Downtown District.

Total operating revenues for fiscal year 1980-81 are estimated at $80,443,442. Passenger fares and other local revenues total $46,243,442 as shown in Exhibit 6. In addition, operating assistance grants received through the Metropolitan Transportation Commission (MTC) total $34,200,000 as shown in Exhibit 7.

Allocation of operating revenue to mode must be indirect in large part since only cash receipts and minor sources such as Sunday/holiday tour tickets for cable cars and cable car tickets themselves are known by mode. The dominant indirect fare source consists of Fast Pass sales, as seen in Exhibit 6. Furthermore, Exhibit 7 shows that operating assistance grants are almost as great as all fare revenues combined.

The best available measure of the relative split of passenger-trips - and, therefore, fares and other local revenues - is the relative split of revenue seat miles among modes. Revenue seat miles do not account for revenue derived from standing room nor for the relatively low revenue per passenger-trip resulting from Fast Pass usage. However, these effects tend to be mixed among modes and also offset each other with respect to downtown service. Therefore, their impact on allocation to mode by revenue seat miles is not viewed as significant. However, we recommend that passenger surveys be conducted in the future to determine more precisely revenue allocation to mode by fare category. Further details of that recommendation are presented in a separate report.

Once local revenues have been allocated to mode, operating assistance grants can be allocated on the basis of pre-grant deficits per mode. These are calculated by subtracting fares and other local revenues from operating expenses for each mode. This leads to the final result of full revenue allocation to mode.

Before proceeding to allocation of fare revenues and operating assistance grants for the full MUNI system as described, it is possible to calculate more precisely the share of total revenues for the less complex cable car system.

EXHIBIT 6

OPERATING REVENUES: FARES AND OTHER REVENUES*

Cash Fare Receipts	$25,332,168
Other Fare Receipts	
Sunday/Holiday Tour Tickets	37,646
BART Discount Tickets	331,755
Tokens	144,502
Fast Pass	19,127,714
Senior Fast Pass	478,934
U.S. Post Office	56,183
Cable Car Tickets	10,352
School Tickets	26,728
Charter Coach	50,481
Subtotal	20,264,295
Other Local Revenues	
Advertising	595,870
Nonoperating Rent	8,142
Miscellaneous	42,967
Subtotal	646,979
Total Fares and Other Local Revenues	$46,243,442

* Source: PUC Report 29/2

EXHIBIT 7

OPERATING REVENUES: OPERATING ASSISTANCE GRANTS*

Source	Amount
Federal Grants	
Urban Mass Transportation Act (Sec. 5)	$12,300,000
State Grants	
Transportation Development Act (Articles 4 and 4.5)	12,000,000
AB1107 Statute	9,900,000
Subtotal	21,900,000
Total Operating Assistance Grants	$34,200,000

* Source: PUC Memo, "1980/81 Subventions - Finals," dated February 10, 1981. AB1107 amount decreased by $1,000,000 for joint pass program (MUNI/BART) capital allocation. AB1107 "carryforward" of $4,900,000 allocated to FY 1979-80 for which it is accrued.

Cable car fare revenue results from a relatively simple two-line system serving a comparatively homogeneous mixture of passengers. Only peak period loadings effect the mixture between local and tourist use of the cable cars. Therefore, a high degree of confidence can be placed in consensus estimates by cable car conductors of the relative share of passenger-trips paid by cash, Fast Pass, transfer and tour tickets for revenue collected. These are shown in Exhibit 8. With an average cash receipt of $0.50 per trip, average Fast Pass utilization at $0.281 per trip,* and the known cash collection, cable car fare revenue by type can be reliably estimated.

The calculation of fare revenues for the cable cars begins with cash receipts of $3,255,863. At $0.50 per trip, this translates to approximately 6,511,726 passenger-trips. The weighted average share of cash trips by day of the week for the full year is 61.5 percent. Therefore, the total number of passenger-trips is 10,583,010. Based on conductor estimates, the Fast Pass share of these trips is 1,874,039, yielding a cash equivalence of $526,605 at $0.281 per trip. In addition, $8,152 of other local revenue are allocated to cable cars based on relative revenue seat miles. Finally, Sunday/holiday tour tickets and cable car tickets totalling $47,998 are allocated in full to cable cars. The resulting share of fares and other local revenues for cable cars is $3,838,618.

Operating assistance grants have also been allocated between cable cars and the other modes. To do this, the pre-grant deficits for both the total MUNI system and the cable cars alone have been calculated. Cable cars account for approximately 5.6 percent of the total pre-grant deficit, so the same share of the $34,200,000 in operating assistance grants, or $1,927,817, has been allocated to cable cars. Thus, the total operating revenues for cable cars equals $5,766,435 as itemized in Exhibit 9.

Allocation of the remaining operating revenues to mode begins with cash fares. These are known by mode from fare box collections. Since other fares and local revenues are collected indirectly, these have been allocated to mode on the basis of revenue seat miles as the best available indicator of passenger-trips by mode. By subtracting these local revenues from operating costs by mode, pre-grant deficits have been determined by mode. Finally, operating assistance grants are allocated to mode on the basis of these pre-grant deficits.

* Resident Adult Fast Pass users pay 16 dollars and average 57 trips per month for $0.281 revenue per trip. Source: Bruce Bernhard (PUC) per Gruen Gruen + Associates survey.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

EXHIBIT 8

ESTIMATED SHARE OF CABLE CAR PASSENGER
TRIPS BY CATEGORY OF REVENUE*

	Monday-Saturday	Sunday/Holiday
Cash	60%	70%
Fast Pass	20	5
Transfer	20	20
Tour and Cable Car Ticket	0	5
	100%	100%

* Percentages of paying passengers as estimated by 12 conductors with minimum percentages adjusted by Touche Ross & Co. Time of day variance included.

EXHIBIT 9

CABLE CAR SHARE OF OPERATING REVENUES

Category	Amount
Cash Fares	$3,255,863
Fast Pass	526,605
Sunday/Holiday Tour Tickets	37,646
Cable Car Tickets	10,352
Related Revenue	8,152
Operating Assistance Grants	1,927,817
Total	$5,766,435

Therefore, the remaining revenues of $74,677,007 are allocated to mode as follows:

- Cash fares of $22,076,305 are known by mode;
- All other fares and other local revenues equalling $20,328,519 are allocated on the basis of relative revenue seat miles; and
- Operating assistance grants of $32,272,183 are allocated to mode on the basis of pre-grant modal deficits determined by subtracting fares and other local revenues from operating costs by mode.

The final results for modal allocation of operating revenues are presented in Exhibit 10.

EXHIBIT 10

ALLOCATION OF OPERATING REVENUES BY MODE

	Street Car	Cable Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Total
Local Revenues	$1,706,923	$3,838,618	$13,887,411	$21,882,532	$ 4,927,958	$ 46,243,442
Pre-grant Deficit						
• Costs	$6,060,998	$8,133,186	$30,661,699	$62,702,786	$14,871,569	$122,430,238
• Local Revenue	1,706,923	3,838,618	13,887,411	21,882,532	4,927,958	46,243,442
• Deficit	$4,354,075	$4,294,568	$16,774,288	$40,820,254	$ 9,943,611	$ 76,186,796
• Percent Deficit by Mode	5.715%	5.637%	22.017%	53.579%	13.052%	100.0%
Operating Assistance Grants	1,954,530	1,927,817	7,529,922	18,324,077	4,463,654	34,200,000
Total Operating Revenue	$3,661,453	$5,766,435	$21,417,333	$40,206,609	$ 9,391,612	$ 80,443,442

Cable Car Costs and Revenues

Cable cars serve the Downtown District. Therefore, a portion of their deficit should be allocated to downtown service. However, the cable car costs and revenues have been omitted from calculation of the downtown and non-downtown deficits for a variety of reasons.

First, there are no ridership data reporting boardings and deboardings for the cable cars comparable to that surveyed on the other modes. Therefore, service-based allocations of fares and other local revenues or operating costs to geographic areas cannot be accomplished reliably.

In addition, the cable cars serve a unique population consisting of some regular users but dominated by tourists. No specific characterization of this market segment exists, but the operating characteristics of the cable car system shown in Exhibit 11 indicate that the nature of service provided on this two-line system is radically different from the other modes. The summary data clearly show the cable cars to be too limited and too slow to compete as an effective transit mode. Therefore, it is reasonable to assume that the population served by such a popular system must also be different from that found on the other modes.

The uniqueness of this served population creates another analytical problem preventing any allocation of the cable car deficit to downtown property owners at this time. There are no trip generation rates available for cable car riders to allocate shares of the deficit to property owners. Rates for this purpose have been developed by the PUC for various types of commercial properties, but these are based on general purpose, transit demand. As a result, they are not applicable to the general body of cable car users.

Finally, Exhibit 12 shows the comparative economics of the five modes. Again, cable cars cannot compete with the other modes on the basis of efficiency. Clearly, the cable cars are justified for other reasons. Assessment to defray their deficit must be made on a basis different from that for the other modes.

For future years, we recommend that the cable cars be treated as a separate transit system and that data to substantiate a separate assessment be collected. Details of these recommendations are presented in a separate report.

EXHIBIT 11

COMPARATIVE OPERATING CHARACTERISTICS BY MODE

	Street Car	Cable Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Total
Actual Revenue Seat Miles (000)	46,285	15,318	318,459	683,559	152,381	1,216,002
Scheduled Vehicle Hours	114,935	158,324	921,300	1,625,950	230,215	3,050,724
Scheduled Vehicle Speed, m.p.h.*	7.6	3.7	7.5	10.4	10.7	9.1

* Calculated as the ratio of scheduled vehicle miles to scheduled vehicle hours.

EXHIBIT 12

ECONOMIC COMPARISON OF TRANSIT MODES

	Street Car	Cable Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Total
Operating Costs	$6,060,998	$8,133,186	$30,661,699	$62,702,786	$14,871,569	$122,430,238
Revenue Seat Miles (000)	46,285	15,318	318,459	683,559	152,381	1,216,002
Cost per Revenue Seat Mile	$0.131	$0.531	$0.096	$0.092	$0.098	$0.101

Capital Expenditures and Revenues

Determination of the net deficit should include capital as well as operating requirements. As with operating costs and revenues, a deficit must first be estimated based on the difference between the need for capital replacement and the funding available to meet this need. Capital requirements are based on replacement rather than the historical cost of assets and on the useful life estimated for accounting purposes.

The funding available for asset replacement is determined by analyzing capital grants actually received and identifying the share of those grants utilized for replacement purposes, as opposed to capital expansion. Because of inadequacies in the data on capital grants, it is not possible to determine the replacement share of capital grants. As a result, capital expenditures and revenues have been excluded from the net deficit calculation for fiscal year 1981-82.

The method to approximate the annual funding needed for capital replacement and an outline of the procedure to calculate the capital component of the assessment fee are described below. Total replacement costs have been estimated for MUNI assets (less cable cars) as well as the overhead lines used by MUNI but which belong to the Hetch Hetchy Project. Assets in use by the PUC Bureaus to support MUNI tend to be comparatively small in value. Therefore, PUC assets have been excluded.

Exhibit 13 shows the total replacement cost of $468,098,483 in 1981 dollars for the assets currently capitalized by MUNI as of March 31, 1981. Cable cars are excluded to be consistent with the analysis of the operating costs and revenues. The replacement cost has been calculated as follows:

- From MUNI accounting records, assets (with the exception of revenue vehicles) are grouped according to mode, type of asset, year of purchase and number of years of useful life.

- For revenue vehicles, replacement costs are based on current vendor prices for comparable equipment and the number of vehicles by mode. It is important to get actual replacement estimates for vehicles because major changes in government requirements and technology have significantly affected vehicle costs.

EXHIBIT 13

REPLACEMENT COSTS OF FIXED ASSETS[1]

MUNI Assets	Street Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Unallocated	Total
Vehicles[2]	$ 42,453,600	$63,186,750	$ 81,021,600	$90,071,190	$ 3,689,048	$280,422,188
Vehicle Related Equipment	1,336,912	-0-	-0-	-0-	-0-	1,336,912
Facilities	58,166,104[3]	21,520,280	6,263	-0-	-0-	79,692,647
Buildings	55,710,298[3]	10,121,904	31,932,578	-0-	-0-	97,764,780
Land	-0-	-0-	-0-	-0-	-0-	-0-
Other Assets	3,368,160	584,898	1,171,989	-0-	3,756,909	8,881,956
MUNI subtotal	161,035,074	95,413,832	114,132,430	90,071,190	7,445,957	468,098,483
Hetch Hetchy Assets	-0-	-0-	-0-	-0-	28,535,799	28,535,799
Total	$16,035,074	$95,413,832	$114,132,430	$90,071,190	$35,981,756	$496,634,282

1. Net of salvage value. MUNI assets up-to-date through March 31, 1981; Hetch Hetchy assets through June 30, 1980.

2.

	Street Car	Trolley Coach	Motor Coach	Light Rail Vehicle
Number of Vehicles	76	345	528	99
Price per Vehicles	$ 570,000	$ 185,000	$ 155,000	$ 919,000
Total Vehicle Replacement	43,320,000	63,825,000	81,840,000	90,981,000
Total Salvage Value	866,400	638,250	818,400	909,810
Net Replacement Cost	$ 42,453,600	$63,186,750	$ 81,021,600	$90,071,190

3. Light rail vehicle (MUNI Metro) facilities and buildings included.

- For other assets, where the basic design and configuration have not significantly changed, replacement cost is estimated based on the price adjusted historical cost. Specifically, a replacement cost in 1981 dollars is calculated for each asset group by:

    - Multiplying the asset's historic cost by the portion of historic cost which can be depreciated. For instance, if an asset has a salvage value of 5 percent, only 95 percent of the asset will be depreciated.

    - Multiplying the depreciable historic cost described above by an appropriate inflator. Appropriate Producer Price Indices and Building and Construction Cost Indices were selected based on an analysis of the characteristics of each asset class.

- The totals by mode are consolidated with the unallocated assets to reach the total replacement cost of $468,098,483 for MUNI assets as of March 31, 1981.

Similarly, the total replacement cost of overhead line assets in 1981 dollars for the Hetch Hetchy Projects equals $28,535,799 for assets capitalized as of June 30, 1980, for a total replacement cost of $496,634,282. Data for MUNI assets are current through March 31, 1981, and for Hetch Hetchy through June 30, 1980.

From this total replacement cost for MUNI and transit-related Hetch Hetchy assets, an average annual replacement charge of $30,458,405 has been determined. This charge corresponds to the average annual amount of capital funds necessary to continually replace transit assets at the end of their useful lives to assure the long-term viability of the system.

Exhibit 14 summarizes this calculation; the procedure is as follows:

- As outlined in Exhibit 13, the replacement cost in 1981 dollars is calculated for each group of assets having the same purchase date and useful book life.

- The 1981 replacement cost is divided by the number of years of useful life for each asset listing to determine its annual replacement charge.

- Annual replacement charges for individual asset listings are added under the major asset categories shown in Exhibit 14.

EXHIBIT 14

ANNUAL REPLACEMENT CHARGE FOR FIXED ASSETS

Muni Assets	Street Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Unallocated	Total
Vehicles*	$ 2,122,680	$ 7,898,344	$10,127,700	$ 3,002,373	$465,334	$23,616,431
Vehicle Related Equipment	71,571	-0-	-0-	-0-	-0-	71,571
Facilities	2,159,763	819,184	159	-0-	-0-	2,979,106
Buildings	1,313,007	300,862	757,901	-0-	-0-	2,371,770
Land	-0-	-0-	-0-	-0-	-0-	-0-
Other Assets	218,493	42,495	97,936	-0-	471,173	830,097
MUNI subtotal	5,885,514	9,060,885	10,983,696	3,002,373	936,507	29,868,975
Hetch Hetchy Assets	-0-	-0-	-0-	-0-	589,430	589,430
Total	$ 5,885,514	$ 9,060,885	$10,983,696	$ 3,002,373	$1,525,937	$30,458,405

	Street Car	Trolley Coach	Motor Coach	Light Rail Vehicle
1. Total Vehicle Replacement Cost	$42,453,600	$63,186,750	$81,021,600	$90,071,190
2. Useful Book Life (yrs)	20	8	8	30
3. Annual Vehicle Replacement Charge (1 : 2)	$ 2,122,680	$ 7,898,344	$10,127,700	$ 3,002,373

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

From this total annual capital funding need, all sources of capital funds utilized for asset replacement must be subtracted to determine a net capital surplus or deficit for asset replacement. Possible sources are capital grants, utilization of funds held by the San Francisco Municipal Railway Improvement Corporation (SFMRIC), net interest income from SFMRIC, and collection of the capital component of the net deficit from the prior year. The key items of information are:

- Which new assets are for replacement and which are for expansion; and

- Which funding sources are used for replacement and which are used for expansion.

A share of the resulting capital surplus or deficit must then be allocated to the Downtown District based on the relative commitment of assets to provide service to downtown. In this way, total deficits consisting of both operating and capital components may be calculated for the downtown and non-downtown areas. These deficits should be the basis for determining the full net deficit for the Downtown District.

In a separate report, we recommend specific methods to calculate the capital portion of the net deficit. In addition, we outline the data collection and documentation needed to support such a system. If implemented, future year calculations of the net deficit could include a capital component as well as the currently calculated operating deficit.

Feeder Line Costs and Revenues

Transit service to the downtown area takes place throughout the MUNI system. Capacity to accommodate passenger-trips to and from the Downtown District must be provided throughout San Francisco. That capacity takes the form of vehicle operations on radial and feeder lines. While radial lines penetrate the Downtown District directly, feeder lines do not. Feeder lines are those which do not enter the Downtown District but which connect with radial lines at transfer stops.

Passengers travelling to or from the Downtown District can accumulate passenger-miles and passenger-trips on both radial and feeder lines. An individual transferring between radial and feeder lines is said to make a linked trip. The share of downtown-related passenger-miles and passenger-trips accumulated on radial lines can be estimated directly from the available boarding and deboarding data as will be seen in the next section. To this should be added the downtown share of passenger usage of feeder lines. However, the magnitude of the transfer effect must be quantified to be able to allocate an appropriate share of passenger-miles and passenger-trips on feeder lines to the Downtown District.

Since the available ridership data base does not trace individual trips from origin to destination, a regression analysis of the boarding and deboarding counts at transit stops has been attempted to provide a basis for quantifying the transfer effect.

The regression was performed with the ridership data over all non-downtown transit stops. Each stop was classified as a transfer or non-transfer stop. Stops which serve major destination areas were also indicated. Reasonable correlations among the following variables were attempted:

- Number of passenger boardings
- Number of passenger deboardings
- Number of on-board passengers
- Sum of passenger boardings and deboardings
- Character of the transit stop
    - Transfer or non-transfer stop
    - Major destination stop or not

In addition, selections among the following data subsets were made:

- Type of vehicle line
  - All lines
  - Radial lines
  - Feeder lines
- Time of day
  - AM or PM
  - AM or PM peak periods
- Direction of vehicle travel
  - Inbound or outbound on radial lines
  - Both directions on feeder lines.

Our analysis using the SPSS regression program* showed the data base to be statistically significant for this purpose, but the amount of data variance explained by the attempted correlations was insufficient to rely on the results. Basically, the sample size of the data base was large enough, but the variations in boarding and deboarding patterns were too great to allow accurate predictions of the transfer effect. The best single regression formula predicted only 38 percent of the variation found in the data. Detailed descriptions of the regressions and results are found in the working papers.

The conclusion from this regression analysis is that the existing data base is insufficient to describe and then quantify the transfer effect between feeder and radial lines. Therefore, all costs and revenues associated with operation of the feeder lines have been excluded from the operating deficit for service to the Downtown District. Instead, these costs and revenues are fully allocated to the non-downtown area in which they occur. As a result, the determination of the net deficit is again made conservative where available data could not approximate allocations to the Downtown District with material accuracy.

* Statistical Package for the Social Sciences, 2nd Edition, McGraw-Hill Book Company, 1975.

ALLOCATION TO THE DOWNTOWN DISTRICT

Introduction

Allocation of operating costs to the Downtown District has been made on the basis of passenger-miles for people travelling to, from or entirely within the district as opposed to those travelling between non-downtown locations. Operating expenses are incurred to provide passenger space, i.e., seats or standing room, over a distance. Therefore, one passenger travelling twice as far as another has consumed twice the capacity provided as the other. The expenses associated with that consumption are twice as great. In our view, operating costs per passenger are a function of distance and should be allocated to the Downtown District on the basis of passenger-miles related to downtown boardings and deboardings.

Allocation of revenue to the Downtown District has been made on the basis of passenger-trips for people travelling to, from or entirely within the district as opposed to those travelling between non-downtown locations. This method has been selected since fares are collected or, in the case of Fast Passes and transfers, acknowledged at the time of boarding. No further revenue is realized as a function of distance travelled. Even passengers who begin their trips on non-downtown or feeder lines but transfer to downtown or radial lines, or vice versa, are properly recognized as potential downtown-related passengers by virtue of their boardings on radial lines. Thus, passenger trips are a valid allocation of revenue for service provided to the Downtown District and can be represented by the downtown-related share of boardings or, equivalently, deboardings as recorded on radial lines.

Passenger Usage Data

The ridership data used as a representative sample of passenger utilization of the MUNI consists of on-going boarding/deboarding surveys of one-way vehicle trips, taken by the Schedule and Traffic Department of MUNI under the requirements of the federal Urban Mass Transportation Act (Section 15). For each survey, there is a survey trip sheet which records the number of people boarding and deboarding the vehicle at each stop of its one-way trip. Mileage between stops is also shown from previous measurement. Each survey identifies the line, direction of travel, date, day of week and start time. Mode is then determined from the vehicle schedules if it is not already indicated on the survey trip sheet. Five such surveys are taken randomly every six days among the lines of the motor coach, trolley coach and combined street car/light rail vehicle modes.

A total of 501 survey trip sheets representing the period from September 10, 1980 through May 16, 1981, have been used as the ridership sample to allocate operating expenses and revenues for these modes to the Downtown District. Surveys taken prior to September 10 could not be used because significant line reorganizations went into effect on that date which made consistent identification of downtown versus non-downtown related usage prior to that date very difficult. Surveys taken after May 16 simply could not be encoded in time for the computer analysis required.

Boarding/deboarding transactions are represented for approximately 24,000 vehicle "stops" including almost 35,000 passengers and over 70,000 passenger-miles. This sizable body of data, though only a small portion of the total MUNI operation, is representative of that operation and provides the basis for valid allocations of expenses and revenues to the downtown and non-downtown areas of San Francisco. Several factors support the validity of the data.

First, vehicle trips within the four modes sampled were selected randomly among lines and by time of day. Selection of vehicle trips to be sampled is made on a random basis by Schedules and Traffic personnel from a numbered list of all individual vehicle trips scheduled within a mode. Bearing out the random selection, the share of morning and evening peak period vehicle trips among the total sampled trips (17 percent) is consistent with the known peak period vehicle hours as a share of total vehicle hours (21 percent). Longer, scheduled times for vehicle trips in the peak periods than in off-peak periods (3 to 15 percent longer) can explain the observed difference in sampled vehicle trips versus actual vehicle hours.

Secondly, the sample size is sufficient to produce smooth graphs of values calculated from independent variables as will be seen in the next section. If the sample size were too small relative to the variations among observed patterns of boardings and deboardings, these graphs would not be smooth or would result in calculated values significantly different from any smooth curves which could be drawn through them.

Finally, for the attempted regression to quantify the transfer effect, the F-test values for statistical significance of the regression exceeded the 99-percent confidence level. Though not a direct measure for significance for other purposes, such a high confidence level is another positive indicator of the validity of the underlying data.

Several methods were employed to assure that only reliable surveys have been included in the data base and that encoding the manually recorded surveys to a computer tape has been accurately and completely performed. First, each survey trip sheet was visually inspected for completeness, legibility and accuracy (equal number of boardings and deboardings). Every survey trip sheet was then "double keyed" or keypunched twice by independent key operators. These were compared to find and eliminate keypunch errors. A raw printout of the resulting data tape was checked manually to see that every survey trip sheet was completely entered. Item-by-item checks of a sample of the printed surveys were also made. Finally, a 100 percent computer edit of all data field formats was made. The result of these quality control procedures is that approximately 20 percent of the original number of surveys were rejected from the data base and that only an insignificant level of errors can remain as evidenced by the final data checks.

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Allocation of Costs

Since feeder line costs have been entirely allocated at present to the non-downtown area, operating costs of each mode must be divided between feeder and radial lines. Then, the downtown share of radial line costs can be calculated as described below. This results in the downtown share of operating costs. The balance of radial line costs and all feeder line costs are attributed to the non-downtown area.

Modal operating costs are split between feeder and radial lines on the basis of the total scheduled vehicle hours within mode for each group of lines. Costs within mode are logically incurred or committed uniformly on the basis of vehicle hours to operate and subsequently to maintain revenue vehicles as well as to provide administrative support. Therefore, this statistic offers the best available means to divide modal operating costs between feeder and radial lines. The resulting split of modal costs is shown in Exhibit 15.

Costs are then allocated to the Downtown District for radial lines by mode on the basis of downtown-related passenger-miles. Because the ridership surveys record only boardings and deboardings at each stop, it is necessary to estimate passenger-miles by means of a series of moving averages. For example, it is possible to calculate the average number of miles travelled by all the people on the bus at any given stop. The miles attributed to passengers that deboard are equal to the average miles travelled per passenger at that point in the trip.

This moving average provides a useful starting point for estimating passenger-miles but is inadequate by itself since persons getting on the bus (carrying zero miles) significantly lower the overall average. If we assume that these people are likely to ride a certain minimum distance before getting off the bus, it is inappropriate to include them in the moving average attributed to deboarders. In other words, we must calculate a second moving average of all passengers who have travelled a specified minimum distance. The average miles per passenger of this group is a better estimate of actual passenger-miles travelled by deboarders.

Passenger-miles, therefore, are calculated in one of two ways. Where possible, passenger-miles for deboarders at a specific stop have been determined by the average miles per on-board passengers who at that point of deboarding have already travelled at least as far as a specified minimum trip distance. If, at that stop, no on-board passengers have travelled the minimum trip distance, then miles accumulated by those on-board passengers who have travelled the greatest distance but not exceeded the minimum trip distance, are assigned to the deboarders at that stop.

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EXHIBIT 15

ALLOCATION OF OPERATING COSTS BY MODE TO FEEDER AND RADIAL LINES

	Street Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Total
Vehicle Hours					
• Feeder Lines	-0-	123,541	510,925	-0-	634,466
• Radial Lines	140,724	787,771	1,179,414	201,006	2,308,915
• Total	140,724	911,312	1,690,339	201,006	2,943,381
Percent of Vehicle Hours					
• Feeder Lines	-0-%	13.6%	30.2%	-0-%	21.6%
• Radial Lines	100.0	86.4	69.8	100.0	78.4
• Total	100.0%	100.0%	100.0%	100.0%	100.0%
Operating Costs					
• Feeder Lines	$ -0-	$ 4,156,619	$18,952,660	$ -0-	$ 23,109,279
• Radial Lines	6,060,998	26,505,080	43,750,126	14,871,569	91,187,773
• Total	$6,060,998	$30,661,699	$62,702,786	$14,871,569	$114,297,052

The key to this methodology is to select an appropriate minimum trip distance to discriminate between the two types of riders. This has been done via the computer code which calculates passenger-miles and passenger-trips from the ridership data to determine the share of expenses and revenues for the Downtown District.

A range of values for the minimum trip distance has been used, and for each, the percent of passengers deboarding with less than that value has been calculated. The resulting cumulative distribution curve for the entire ridership sample is shown in Exhibit 16. The criterion for selection of the minimum trip distance is that point where the increase in the rate of increase in the percent of "short" deboarders is maximum. In Exhibit 16, that value is 0.60 miles, resulting in 5 percent of all passengers deboarding with less than that distance. The gradual curvature of the graph below 0.60 miles suggests that those passengers have a similar pattern of behavior. Above 0.60 miles, the suddenly steeper but relatively constant curve suggests a different pattern. Thus, the relative number of passengers in the two categories of passengers may be reliably determined.

For the actual allocations of expenses to the Downtown District, it is necessary to analyze separately the passenger patterns of radial lines by mode. Minimum trip distances for each such set of vehicle trips must also be determined. The process is, however, the same. The results are shown in Exhibit 17. All the modes appear similar, except light rail vehicles. The light rail vehicle mode can be expected to have a longer minimum trip distance since it is a high speed, limited access mode with greater distances between stops compared to the other three modes.

Beyond selecting the minimum trip distance and determining the passenger-miles for those who deboard in the Downtown District, passenger-miles must also be calculated for those who board in the District and then leave it. This can only be done by determining a downtown-related share of passenger-miles for those who deboard in the post-downtown portion of the vehicle trip. That portion is best approximated by the number of on-board passengers who leave the Downtown District divided by the total number of post-downtown deboarders. This fraction times the number of passenger-miles associated with all post-downtown deboarders best represents the passenger-miles for downtown boarders who leave the District.

The overall number of downtown-related passenger-miles on radial lines is the sum of passenger-miles for radial line downtown deboarders and downtown boarders who exit the District. That total is divided by the total passenger-miles for all riders on radial lines by mode. This represents the share of costs for radial lines by mode to be allocated to the Downtown District. The balance of radial line costs and all feeder line costs are added and attributed to the non-downtown area. Results of this calculation to allocate costs to the Downtown District and to the non-downtown area are shown in Exhibit 18.

EXHIBIT 16

SHORT DEBOARDERS COMPARED TO MINIMUM TRIP DISTANCE VALUES

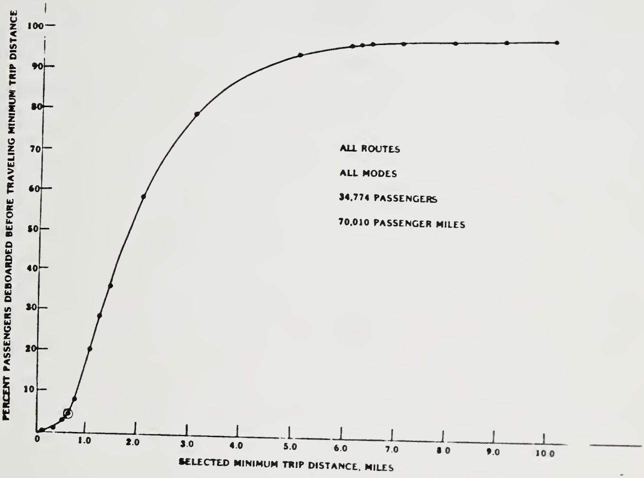

EXHIBIT 17

SELECTED MINIMUM TRIP DISTANCES FOR RADIAL LINES BY MODE

	Minimum Trip Distance, Miles	Passenger Deboarded Short, Percent
Street Car	0.60	5.0%
Trolley Coach	0.55	5.0
Motor Coach	0.65	5.0
Light Rail Vehicle	1.10	8.5

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EXHIBIT 18

ALLOCATION OF COSTS
TO THE DOWNTOWN DISTRICT

	Street Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Total
Total Operating Costs	$6,060,998	$30,661,699	$62,702,786	$14,871,569	$114,297,052
Feeder Line* Costs	-0-	4,156,619	18,952,660	-0-	23,109,279
Radial Line Costs	$6,060,998	$26,505,080	$43,750,126	$14,871,569	$ 91,187,773
Downtown Share of Radial Line Passenger-Miles	70.808%	68.404%	70.909%	69.849%	70.001%
Downtown Share of Operating Costs	$4,291,671	$18,130,535	$31,022,777	$10,387,642	$ 63,832,625
Non-Downtown Share of Operating Costs	$1,769,327	$12,531,164	$31,680,009	$ 4,483,927	$ 50,464,427

* From Exhibit 15

Allocation of Revenues

As in the allocation of costs, revenues must be assigned to feeder and radial lines before they can be allocated to the Downtown District. Fares and other local revenues are split between feeder and radial lines based on passenger trips measured by the ridership survey results. The specific percentages applied for this purpose are shown in Exhibit 19.

Once these revenues have been allocated, it is possible to calculate a pre-grant operating deficit and, as we did in the modal allocation above, split operating grants between feeder and radial lines on this basis. This allocation of operating assistance is presented in Exhibit 20.

The final revenue allocation is for the downtown-related share of radial line revenues by mode. Local revenues are allocated on the basis of passenger-trips on radial lines to, from, or entirely within the Downtown District. Passengers who never enter or who pass through the downtown area without boarding or deboarding in the District are attributed to the non-downtown area. The downtown shares of passenger-trips for radial lines by mode multiplied by the radial line shares of local revenue by mode results in the downtown share of local revenues by mode.

Because downtown-related trips may involve downtown boardings, deboardings or both if the passenger-trip is entirely within the District, determination of the share of such trips from just boarding/deboarding data is not straightforward. It is possible for different combinations of passenger-trips to, from, within and through the District to result in the observed number of boardings and deboardings. Since individual trips cannot be traced, a fraction of downtown-related trips must be defined based on boardings and deboardings. Different fractions must be defined for inbound and outbound vehicle-trips to approximate correctly the downtown share of passenger-trips.

For inbound vehicle-trips, the approximate fraction of downtown-related passenger trips is the sum of boardings and deboardings in the Downtown District divided by the sum of all deboardings throughout the vehicle-trip plus downtown boardings. Such a fraction is made necessary by passengers who both board and deboard within the district. These passengers are unavoidably counted twice on vehicle-trips which pass through the District. Therefore, to eliminate over-allocation of passenger-trips and consequently local revenues to the downtown, the denominator for inbound vehicle-trips has been increased by adding the sum of downtown boardings to it. On inbound vehicle trips, the number of downtown boarders will be small relative to downtown deboarders. As a result, this fraction will closely approximate the true but unknown share of downtown-related passenger-trips.

EXHIBIT 19

SAMPLED PASSENGER SPLIT BETWEEN FEEDER AND RADIAL LINES

Percentage of Passenger-Trips	Street Car	Trolley Coach	Motor Coach	Light Rail Vehicle
Sampled Number of Passenger-Trips				
• Feeder Lines	-0-	694	2,610	-0-
• Radial Lines	4,628	12,241	7,006	7,595
• Total	4,628	12,935	9,616	7,595
Percentage of Passenger-Trips				
• Feeder Lines	0%	5.37%	27.14%	0%
• Radial Lines	100.00	94.63	72.86	100.00
• Total	100.00%	100.00%	100.00%	100.00%
Split of Local Revenues				
• Feeder Lines	$ -0-	$ 745,100	$ 5,939,414	$ -0-
• Radial Lines	1,706,923	13,142,311	15,943,118	4,927,958
• Total	$1,706,923	$13,887,411	$21,882,532	$4,927,958

EXHIBIT 20

ALLOCATIONS OF OPERATING REVENUES
TO FEEDER AND RADIAL LINES BY MODE

	Street Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Total
Feeder Lines:					
Local Revenues	$ -0-	$ 745,100	$ 5,939,414	$ -0-	$ 6,684,514
Operating Assistance	-0-	1,531,420	5,841,603	-0-	7,373,023
Subtotal	-0-	2,276,520	11,781,017	-0-	14,057,537
Radial Lines:					
Local Revenues	1,706,923	13,142,311	15,943,118	4,927,958	35,720,310
Operating Assistance	1,954,530	5,998,502	12,482,474	4,463,654	24,899,160
Subtotal	3,661,453	19,140,813	28,425,592	9,391,612	60,619,470
Total Operating Revenues	$3,661,453	$21,417,333	$40,206,609	$9,391,612	$74,677,007

Likewise, for outbound vehicle-trips, the fraction representing the downtown share of passenger-trips has been defined as the sum of boardings and deboardings in the Downtown District divided by the sum of all deboardings throughout the vehicle-trip plus downtown deboardings. This definition again offsets double counting of passengers who travel entirely within the District. For outbound vehicle-trips, it also approximates the true but unknown share of downtown-related passenger-trips since the number of downtown deboarders will be small relative to downtown boarders.

For the extensive sample of vehicle-trips available, the overall accuracy in determining the downtown share of passenger-trips is considered to be the best possible and materially accurate. Errors in the estimated shares of downtown passenger-trips on individual vehicle-trips will offset each other for the total mix of vehicle-trips sampled. Significant improvement in this procedure could only be achieved by obtaining new survey data which would trace individual passenger-trips from origin to destination.

From the individual vehicle trips, an overall share of downtown-related passengers can be determined for radial lines by mode. These then determine the downtown share of local revenues for the radial lines by mode. Exhibit 21 shows the results of this calculation for the downtown shares of local revenues.

The final step in allocations of both costs and revenues is to determine the operating deficits for the downtown and non-downtown areas. This can be done based on the previous allocations of operating costs and local revenues for radial and feeder lines to the Downtown District.

Exhibit 22 shows this process and results. Downtown operating costs and local revenues have been subtracted from total operating costs and local revenues to give the non-downtown shares. From the resulting pre-grant deficits for the two areas, the shares of operating assistance grants for the two areas are determined. Further subtraction of these grant amounts from the pre-grant deficits results in the full operating deficits for the downtown and non-downtown areas.

EXHIBIT 21

ALLOCATION OF RADIAL LINE LOCAL REVENUES TO THE DOWNTOWN DISTRICT

	Street Car	Trolley Coach	Motor Coach	Light Rail Vehicle	Total
Radial Line Local Revenue, Dollars	$1,706,923	$13,142,311	$15,943,118	$4,927,958	$35,720,310
Downtown Share of Radial Passenger-Trips, Percent	73.105%	68.994%	68.755%	66.745%	68.774%
Downtown Share of Radial Local Revenues, Dollars	$1,247,846	$9,067,406	$10,961,691	$3,289,166	$24,566,109

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EXHIBIT 22

ALLOCATION OF OPERATING COSTS AND REVENUES TO THE DOWNTOWN AND NON-DOWNTOWN AREAS

	Downtown	Non-Downtown	Total
Operating Costs			
• Radial Lines	$63,832,625	$27,355,148	$ 91,187,773
• Feeder Lines	-0-	23,109,279	23,109,279
Subtotal	63,832,625	50,464,427	114,297,052
Local Revenues			
• Radial Lines	24,566,109	11,154,201	35,720,310
• Feeder Lines	-0-	6,684,514	6,684,514
Subtotal	24,566,109	17,838,715	42,404,824
Pre-Grant Deficit	39,266,516	32,625,712	71,892,228
Share of Pre-Grant Deficit, Percent	54.619%	45.381%	100.0%
Operating Assistance Grants	17,626,609	14,645,574	32,272,183
Operating Deficits	$21,639,907	$17,980,138	$ 39,620,045

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[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

DETERMINATION OF THE NET DEFICIT

Introduction

Once the operating and capital deficits for the downtown and non-downtown areas have been determined, the final step in calculating the net deficit is to compare the relative levels of service to the two areas in terms of these deficits. A quantitative measure of this difference can then be used to calculate the net deficit for service to the Downtown District in excess of that to the rest of the City. Apportionment of this net deficit to commercial property owners within the Downtown District will be accomplished by applying the relative amount of floor space of each property and transit trip generation rates per 1,000 square feet of floor space. Such rates for this purpose are being determined by the staff of the PUC Bureau of Finance.

Calculation of the Net Deficit

The difference in service level between the two areas is best represented by the relative concentration of service and demand in the two areas. The downtown area is characterized by geographically concentrated service and demand. Many routes are frequently run in a confined area to serve a concentrated demand in that area. By comparison, the non-downtown area has a much more diffuse route structure and demand concentration, though a significantly larger land area is involved. Since relative shares of expenses and revenues represent the relative use of service and demand, respectively, the deficits for the two areas divided by their respective land areas are valid quantitative measures for the relative level of service to the areas. This measure states the relative level of service between the two areas on a common basis.

The net deficit for the level of service to the Downtown District in excess of that provided to the non-downtown area then becomes the difference between their deficits per square mile multiplied by the land area of the Downtown District. Exhibit 23 shows this calculation, which results in a net deficit for fiscal year 1981-82 of approximately $20,780,215.

EXHIBIT 23

CALCULATION OF THE NET DEFICIT

	Downtown District	Non-Downtown Area	Total
Operating Deficit	$21,639,907	$17,980,138	$39,620,045
Capital Deficit	-0-	-0-	-0-
Total Deficit	$21,639,907	$17,980,138	$39,620,045
Land Area, Square Miles	2.074(*)	43.377(**)	
Deficit per Square Mile	$10,433,899	$ 414,509	
Excess Downtown Deficit per Square Mile:			$10,019,390
Total Net Deficit:			$20,780,215

(*) Determined by planimeter measurement of the Downtown District defined by Gruen Gruen + Associates on a 1978 1":800' scale map of San Francisco.

(**) Determined by subtracting the area of the Downtown District from the known area of 45.451 square miles for mainland San Francisco County.

APPENDICES

1. Allocation Methods - Supporting Data
2. Notes to Exhibits 3, 4 and 5
3. Annualization of Partial Fiscal Year Costs to a Twelve-Month Basis
4. Organization, Notation and Conventions Used in Exhibits 3, 4 and 5

APPENDIX 1

ALLOCATION METHODS - SUPPORTING DATA

1. Scheduled Total Vehicle Hours

Data Source: Recapitulation and Analysis of Schedules, MUNI Schedule and Traffic Department. Principal Contact: Seth Green, X4062

This statistic was calculated for Fiscal Year 1980-1981 using modal schedules in effect for the periods:

July 1, 1980	through	September 9, 1980;
September 10, 1980	through	December 16, 1980;
December 17, 1980	through	April 7, 1981;
April 8, 1981	through	June 16, 1981; and
June 17, 1981	through	June 30, 1981.

The MUNI system had different schedules in effect for each of these periods. Within each period, total vehicle hours were accumulated per Weekday/Schoolday, Saturday and Sunday/Holiday schedules. Street Car and Light Rail Vehicle were shown as a combined mode. Therefore, these two modes were split per route schedules for the week of April 8, 1981. The combined hours for these two modes had previously been determined to be 10.7 percent of the total for all modes for the week of April 8 versus 11.3 percent for the entire year. Therefore, only immaterial error is expected from this approximation.

The results of this calculation for the entire fiscal year are as follows:

Mode	Scheduled Total Vehicle Hours	Percent
Street Car	114,934.9	3.8%
Cable Car	158,324.3	5.2
Trolley Coach	921,300.2	30.2
Motor Coach	1,625,949.7	53.3
Light Rail Vehicle	230,214.9	7.5
Total	3,050,724.0	100.0%

2. Cumulative Training Schedule Course Units

Data Source and Principal Contact: Ron Custer, X4897

Five percent of all resources for training and safety are spent in support of Cable Cars. The remaining ninety-five percent are spent to support the other four transit modes per a repeating training cycle of courses as follows:

Street Car/Light Rail Vehicle	35 units
Trolley Coach	25 units
Motor Coach	50 units

Street Car and Light Rail Vehicle were split in a 5/95 ratio.

The result is the following distribution:

Street Car	1.5%
Cable Car	5.0
Trolley Coach	21.6
Motor Coach	43.2
Light Rail Vehicle	28.7
Total	100.0%

3. Allocation Percentage of Floor Space

Data Source and Principal Contact: Brian Cunningham, X3786

Brian estimated total floor space utilization for direct and indirect support of modal operations as follows:

Street Car/Light Rail Vehicle	35.12%
Trolley Coach	32.32%
Motor Coach	26.79%
Cable Car	5.77%

Street Car and Light Rail Vehicle were again split according to scheduled total vehicle hours. The final allocation percentages are:

Street Car	11.62%
Cable Car	5.77
Trolley Coach	32.32
Motor Coach	26.79
Light Rail Vehicle	23.50
Total	100.00%

4. Percentage of PUC Budget versus Water/Hetch Hetchy

Data Source: MTA 785 Computer Program, dated June 16, 1981.

	Dollars	Percent
MUNI	$122.4 M	57.1%
Water	36.3 M	17.0
Hetch Hetchy	55.5 M	25.9
Total	$214.2 M	100.0%

Relative shares of cost for administrative activities of the PUC or City in general support of the three PUC departments are allocated in proportion to the relative size of the PUC departments. The selected measure of relative size is the magnitude of Fiscal Year 1980-1981 budgeted dollars. Actual expenses are not used since a detailed examination of Water and Hetch Hetchy costs would be required to annualize them. Budgeted dollars based on prior year experience are judged to be sufficiently accurate for this purpose.

5. Percentage of Actual Workman's Compensation Payments Through March 31, 1981

Data Source: Billing Working Paper. Principal Contact: Nini Leigh, X4866

Total Workman's Compensation paid through March 31, 1981, was $1,512,893. Of this total, $1,348,958 (89.16%) were for MUNI-related cases. This known percentage was then applied to the estimated annual total.

6. Percentage of Work Days Lost Due to Injury Through March 31, 1981.

Data Source and Principal Contact: Jack Klinger, X5966

Total work days lost due to injury were compiled per the six MUNI Divisions and allocated to mode by the principal activities of these divisions. Division identification with modes is as follows:

Geneva	5% Street Car/95% Light Rail Vehicle
Kirkland	Motor Coach
Woods	Motor Coach
Potrero	Trolley Coach
Presidio	Trolley Coach
Cable Car Division	Cable Car

Work days lost due to injury per mode are:

	Days	Percent
Street Car	46	0.6%
Cable Car	1,183	14.5
Trolley Coach	2,479	30.3
Motor Coach	3,595	44.0
Light Rail Vehicle	869	10.6
Total	8,172	100.0%

7. Percentage of Headcount: MUNI vs. Water/Hetch Hetchy

Data Source and Principal Contact: Demo Adams, X5564

Current, approximate headcounts among the three departments and the Bureaus are:

MUNI	3,660
Water	490
Hetch Hetchy	193
Subtotal	4,343
Bureaus	460
	4,803

With Bureau personnel considered to be overhead necessary to support the operations of the three departments, the percentage among just the three departments becomes the allocation statistic:

MUNI	84.27%
Water	11.28
Hetch Hetchy	4.44
Total	99.99%

8. Percentage of Actual Claims Payments Through March 31, 1981

Data Source: Billing Working Paper. Principal Contact: Nini Leigh, X4866.

Total claims paid through March 31, 1981, were $2,673,365. Of this total, $2,654,234 (99.3%) were for MUNI-related cases. This known percentage was then applied to the estimated annual total.

9. Scheduled Revenue Vehicle Hours

Data Source: Recapitulation and Analysis of Schedules, MUNI Schedule and Traffic Department. Principal Contact: Seth Green, X4062

Total scheduled revenue vehicle hours per mode were used from the Weekday/Schoolday, Saturday and Sunday/Holiday schedules in effect during the week of April 8, 1981, projected to the entire fiscal year. Modal comparison of total scheduled vehicle hours projected to the full year from this week to the total scheduled vehicle hours calculated through each period of schedule changes (see Section 1 of this Appendix), shows a maximum modal error of approximately 1.2 percent. Therefore, error in projecting modal scheduled revenue vehicle hours from the week of April 8, 1981, is expected to be of the same magnitude and, therefore, immaterial for this application.

10. Estimated Percentage of Machine Time: MUNI vs. Water/Hetch Hetchy

Data Source and Principal Contact: Jack Hall, X3988

Both OS and DOS operating systems are used to run computer programs affecting MUNI. Machine time records have only recently begun to be kept comprehensively and reliably. In lieu of such records, Jack Hall estimates total machine time utilization in support of the three departments to be:

MUNI	49%
Water	49
Hetch Hetchy	2
	100%

11. Percentage of Number of Grants Processed

Data Source and Principal Contact: Louis Tucciarone, X2075

Administrative expenses in the Bureau of Engineering identified as MUNI-related were allocated to mode based on the percentage of the number of grants processed. Mode specific grants were first counted. Then, general purpose grants were allocated to mode on the basis of total scheduled vehicle hours. The results are as follows:

	No. of Grants	Percent
Street Car	4.2	18.26%
Cable Car	1.2	5.22
Trolley Coach	2.5	10.87
Motor Coach	4.7	20.43
Light Rail Vehicle	10.4	45.22
Total	23.0	100.00%

12. Scheduled Lease Payments

Data Source: MUNI-related Lease Documents Principal Contact: Nini Leigh, X4866

The following capitalized leases required interest payments to the San Francisco Municipal Railway Improvement Corporation (SFMRIC):

	Mode Supported
Facilities Lease No. 1, Phase II	Motor Coach
Facilities Lease No. 1A	Cable Car/Light Rail Vehicle
Facilities Lease No. 2, Supplement 1	Motor Coach
Facilities Lease No. 3	Light Rail Vehicle
Equipment Lease No. 3	Light Rail Vehicle

Payments on Facilities Lease No. 1A in support of the Cable Car and Light Rail Vehicle modes were split on a 5.5/94.5 ratio, respectively, per Al Hollett, X3334.

Therefore, the combination of payroll errors almost exactly cancel. This means there is relatively little error in the overall costs and suggests that a review of payroll reporting by location and work assignment be conducted to eliminate misreporting.

Allocation of Account No. 1-33344, Ways and Structures, Building Maintenance (Payroll), to mode in the amount of $2,170,000 has been made in the following manner:

a. Annual budgeted Direct Payroll for activities identifiable as support for specific modes has been determined with Brian Cunningham. The Street Car and Light Rail Vehicle modes have been treated as one combined mode.
b. Annual budgeted Direct Payroll for activities not identifiable as support for specific modes has been allocated to modes by the percentage of floor space utilization by mode as determined by Brian Cunningham. Again, the Street Car and Light Rail Vehicle modes have been treated as one combined mode.
c. Total annual budgeted Direct Payroll per mode has been determined by adding (a) and (b).
d. The Street Car and Light Rail Vehicle modes have been split per their respective scheduled total vehicle hours.
e. Allocation percentages for annual estimated Total Payroll have been calculated from the results of (a) through (d).

4. Account No. 1-33344, Ways and Structures, Building Maintenance (Light, Heat and Power: Propulsion). Electric power for propulsion of electric vehicles is expensed to Accounts 3-3450Y and 3-3451Y for Y = 1 through 9. These accounts summed for the year can result in the total estimated cost.

Allocation to modes should then be done based on the modal percentage of total kilowatt-hours consumed for propulsion. This can be calculated by multiplying the modal actual miles by the modal rate of energy consumption (kwhr/mile). These consumption rates are per Linda Coguira, X4866:

	KwHr/Mile
Street Car	5.525
Cable Car	5.5
Trolley Coach	4.45
Light Rail Vehicle	9.5

Allocation to mode was done this way through January 31, 1981, for lack of full year data. February was then allocated in the same manner but as an individual month. March through June were

estimated based on actual modal miles March through June multiplied by the cost per mile derived from February. Results per mode for the entire year were then calculated by adding the results for these three periods.

5. Account No. 1-33410, MUNI General Manager, Administration. Expenses reported June 16, 1981, for the period July 1, 1980 through May 31, 1981, have been reduced to exclude Administrative Services (PUC), which represent an allocation of PUC Bureau expenses to MUNI. Instead, Bureau expenses have been specifically reviewed and allocated to MUNI under Account No. 1-32000, Bureau Summary.

In addition, Account No. 33410, MUNI General Manager, Administration, has been reduced to partially reflect overstatement of payroll as estimated by Robin Burghstahler at approximately $327,000. Robin also estimated an understatement of payroll of approximately $99,000 through March 31, 1981 for Account No. 1-33420, MUNI General Manager, System Safety. Buford Johnson provided personnel data for Account No. 1-33430, MUNI General Manager, Planning, which indicate that a payroll understatement of approximately $138,500 will occur for the full year. Extrapolating the System Safety understatement to a full year (approximately $132,100) and adding the Planning understatement gives a total estimated understatement of approximately $270,600. The combined effects of these corrections are as follows:

Account Number	Estimated Overstatement	Estimated Understatement
1-33410	$327,100	
1-33420		$132,100
1-33430		138,500
	$327,100	$270,600

Account No. 1-33410, MUNI General Manager, Administration, has, therefore, been reduced by $270,600 while Account No. 1-33420, MUNI General Manager, System Safety and Account No. 1-33430, MUNI General Manager-Planning, have been increased by their respective amounts.

6. Account No. 1-33420, MUNI General Manager, System Safety. The reported expenses for this account have been increased by $132,100 per Note 5. Expenses have then been allocated to mode in two parts:

   a. Per Guy Wright, 65 percent of expenses can be allocated to modes for specific safety programs as follows:

Street Car	10%
Cable Car	5%
Trolley Coach	10%
Motor Coach	15%
Light Rail Vehicle	25%

   b. Also per Guy Wright, 35 percent of expenses can be allocated to modes for general safety programs by scheduled total vehicle hours.

7. Account No. 1-33430, MUNI General Manager, Planning. Annual expenses for this account calculated from cost reports have been increased by $138,500 per Note 5.

8. Account No. 1-32120, Bureau of Administration, Personnel (Non-Workman's Compensation). Annual expenses for this account have been decreased for one individual who actually works in the Bureau of Finance but whose payroll cost is reported in this account. The amount is $36,920. This non-Workman's Compensation component of Account No. 1-32120, Bureau of Administration, Personnel, is then allocated to mode by scheduled total vehicle hours.

9. Account No. 1-32140, Bureau of Administration, Claims. Annualized MUNI claims have been estimated per Reed Jordan as approximately $2,890,000, paid in Fiscal Year 1980-1981 through May with an additional $488,000 to be paid in June for a total of approximately $3,378,000 for the entire fiscal year. Reed also estimates related litigation expenses to be approximately $220,000 for the year. In addition, Claims Section personnel costs for MUNI for the year are estimated at 27 to 31 people with an annual budget of approximately $638,000 for a total of approximately $555,700. Therefore, the total for this account is approximately $4,154,000.

Allocation to mode is based on Reed Jordan's total claims payed by mode through March 31, 1981. Claims for the remainder of the fiscal year consist of a general mixture felt by Reed to be consistent with the earlier percentages. End of year time pressure prevented Reed from being able to update his March 31, 1981, tally by mode in time for this report. The percentages for allocation are as follows:

Street Car	17.81%
Cable Car	14.79
Trolley Coach	19.35
Motor Coach	47.44
Light Rail Vehicle	0.60
	100.00%

10. Account No. 1-32240, Bureau of Finance, Resource Development. Annual expenses for this account have been increased by $36,920 per Note 8.

11. Account No. 1-32330, Bureau of Management Information Systems, Systems/Programming. Annual expenses for this account have been allocated to MUNI based on personnel usage of an eleven-person programming staff. Relative headcount usage and allocation is as follows:

3.0	Finance)	Allocated to MUNI on
2.5	Payroll)	Percentage of PUC
0.5	Miscellaneous)	Budget vs. Water/
1.0	Inventory)	Hetch Hetchy
1.5	MUNI Work Orders	All MUNI
1.0	Water Department Support	All Water Department
1.5	New Personnel in Training	Net of All the Above
11.0		

The resulting allocation percentages are: MUNI - 57.9%; Water - 23.0%; Hetch Hetchy - 19.1%.

APPENDIX 3

ANNUALIZATION OF PARTIAL FISCAL YEAR COSTS TO A TWELVE-MONTH BASIS

Reported PUC and MUNI costs for this cost analysis were taken from the June 16, 1981, issue of the MTA785 Program, "Organizational Management Performance Report as of May 31, 1981." This program presents budgeted and actual expenses by current month and year to date. However, the actual inclusion of year-to-date costs in this report varies with type of cost.

Payroll expenses are only reported through May 19, 1981, the end of the last complete pay period prior to May 31. Therefore, only 23 of the full year's 26 two-week pay periods are included. Annualization of reported payroll is accomplished by multiplying reported values by the ratio 26/23 or 1.1304.

In addition, Bureau of Light, Heat and Power billings to MUNI have only been included through February 28, 1981, per Linda Coquira, X4866. Electricity for the full year is extrapolated from the "Bureau of Light, Heat and Power Electric Summary, Appropriation No. 735" through April 1981. The annualization factor for electricity costs is calculated by dividing this total by the reported February 28 total, or $1,491,784 divided by $985,367, equalling 1.5139. Gas is calculated for the full year by extrapolating the February 28 total to twelve months.

Lastly, all other types of costs, i.e., materials/ supplies, contract services, etc., reported in the MTA785 program are estimated by Harold Guetersloh and confirmed by Bruce Bernhard to include only approximately ten percent of May's actual totals. This lag effect is caused by normal processing. Therefore, annualization of all other types of costs is accomplished by the ratio of reported months divided into twelve full months, or 12/10.1, equalling 1.1881.

APPENDIX 4

ORGANIZATION, NOTATION AND CONVENTIONS USED IN EXHIBITS 3, 4 AND 5

Exhibits 2, 3 and 4 have been organized into columns with information as follows:

(1) Account Number. Cost Account numbering system used for the PUC in the MTA 785 computer program, "Organizational Management Performance Report as of May 31, 1981," issued June 16, 1981. This account structure is uniformly applied to cover operating costs, interest payments, and depreciation (excluded here) for the PUC Bureaus, MUNI, the Water Department and the Hetch Hetchy Project.

(2) Account Name. Cost account titles for each Cost Account Number used for the PUC.

(3) Cost Description. Expenses by type, e.g., payroll, material and supply, etc., charged to the Account Number which are included in the allocation methods and results of subsequent columns. Where all expenses charged to an Account Number are included, this column simply states "All."

(4) Allocation Method to MUNI. Method by which an equitable share of PUC expenses outside the MUNI cost structure itself are allocated to MUNI for PUC activities in direct or indirect support of the MUNI transit system.

Where allocation is based on the sum of previously allocated accounts, the following convention has been adopted:

"Sum of 1-32X00 Accounts" means the sum of total expenses shown in these exhibits for Allocation Method to MUNI or the sums of modal expenses shown in these exhibits for Allocation Method to Mode for all Account Numbers used in these exhibits of this form where "X" is allowed to vary. Thus, "Sum of 1-32X00 Accounts" listed under Allocation Method to MUNI means the sum of total expenses for Account Numbers 1-32100, 1-32200, 1-32300, 1-32400, 1-32500 and 1-32600. Listed under Allocation Method to Mode, "Sum of 1-32X00 Accounts" means the sums of modal expense for Account Numbers 1-32100, 1-32200, 1-32300, 1-32400, 1-32500 and 1-32600.

Where allocation is based on sub-accounts in the MTA 785 program which are not shown in these exhibits, the following conventions have been adopted:

(a) Such Account Numbers are preceded by the term "MTA 785."

(b) Sums of accounts are again specified for allocation to MUNI or to Mode by use of variable digits within a specified form of Account Number. In this case, however, the range of the variable digits over which accounts are to be summed has also been specified.

Thus, "MTA 785" Accounts 3-210XY; X = 0 to 2; Y= 1 to 3 means that total or modal expenses are to be summed for sub-accounts 3-21001, 3-21002, 3-21003, 3-21011, 3-21012, 3-21013, 3-21021, 3-21022 and 3-21023.

Where a generally applicable analysis has been used for allocation of a specific account, this is described by a concise phrase with reference to Appendix 1 for detailed explanation under the same concise phrase.

Where a special analysis has been required to allocate expenses, reference to a specific note has been made for detailed explanation of that analysis.

Finally, where the source of an allocation method has resulted in part or in whole from interviews with key individuals responsible for areas where available documentation alone is insufficient, that individual's name and PUC Centrex telephone extension have been listed in the allocation method column or applicable notes or appendices.

(5) Allocation Method to Mode. Method by which an equitable share of the total expenses for the Account Number previously allocated to MUNI are subsequently allocated to one of the five transportation modes of the MUNI transit system: Street Car, Cable Car, Trolley Coach, Motor Coach and Light Rail Vehicle.

Conventions previously adopted and explained under "Allocation Method to MUNI" for summing expenses of various accounts apply here as well.

Conventions for referencing notes, appendices or key individuals previously adopted and explained under "Allocation Method to MUNI" apply here as well.

The annualized expenses for the costs allocated to MUNI and to Mode for each Account Number are then shown for each mode and in total.